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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/469,190 12/21/99 HIEDA

K 04329.2210

EXAMINER

MM91/0913

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GARRETT & DUNNER LLP
1300 I STRRET NW
WASHINGTON DC 20005-3315

ART UNIT	PAPER NUMBER
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2811

DATE MAILED:

09/13/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/469,190

Applicant(s)

HIEDA ET AL.

Examiner

Hung K. Vu

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 June 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 1-9, 11-13, 16-18 and 20-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10, 14, 15, 19 and 24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Embodiment 5 of Figures 8A and 8B, claims 1-11 and 14-20, in Paper No. 9 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Applicant's election without traverse of Embodiment 5 of Figures 8A and 8B, claims 1-11 and 14-20 in Paper No. 9 is acknowledged.

Claims 1-9, 11-13, 16-18, and 20, which are belong to nonelected species, and claims 21-23 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 9.

Claim Objections

2. Claims 10 and 19 are objected to because of the following informalities: In claim 10, line 10, and claim 19, line 9, "a upper" should be changed to "an upper" for clarity. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 19 is rejected under 35 U.S.C. 102(b) as being anticipated by Kashihara et al. (PN 5,567,964).

Kashihara et al. discloses a semiconductor device comprising,

A semiconductor substrate (31);

A conductive plug (43a) formed on the semiconductor substrate;

A lower electrode (1) formed in contact with the conductor plug;

A capacitor insulating film (11a) formed on a side of the lower electrode;

An upper electrode (5) formed above the lower electrode via the capacitor insulating film,

The capacitor insulating film (3) being formed above a top surface of the lower electrode via a second insulating film different from the capacitor insulating film. Note Figures 1, 11-14, 18, and 24 of Kashihara et al..

4. Claim 10, 14, 19, and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Zenke (PN 5,811,333).

Zenke discloses a semiconductor device comprising,

A semiconductor substrate (1);

A conductive plug (lower portion of 3) formed on the semiconductor substrate;

A lower electrode (upper portion of 3) formed in contact with the conductor plug and constituted by a plurality of crystal grains;

A capacitor insulating film (5) formed on a side of the lower electrode;

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An upper electrode (6) formed above the lower electrode via the capacitor insulating film,

A grain boundary between adjacent two of the plurality of crystal grains constituting the lower electrode being substantially perpendicular to an interface between the lower electrode and the capacitor insulating film. Note Figures 3A-3D and 4A-4B of Zenke.

With regard to claim 14, Zenke discloses wherein a lower end portion of the lower electrode is covered by an insulating film (lower portion of 5) different from the insulating film (upper portion of 5).

With regard to claim 19, Zenke discloses the capacitor insulating film being formed above a top surface of the lower electrode via a second insulating film (lower portion of 5) different from the capacitor insulating film (upper portion of 5). Note Figures 1A-1D, 3A-3D, and 4A-4B of Zenke.

With regard to claim 24, Zenke discloses wherein the lower electrode is used as a memory cell of a stack-type DRAM.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zenke (PN 5,811,333) in view of Kashihara et al. (PN 5,567,964).

Zenke discloses all of the claimed limitations except the capacitor insulating film on the top surface of the capacitor lower electrode being thicker than that on the side of the lower electrode. However, Kashihara et al. discloses a device having a capacitor insulating film (3) on the top surface of a capacitor lower electrode (1) being thicker than that (11a) on the side of the lower electrode. Note Figures 1, 11-14, 18, and 24 of Kashihara et al.. Therefore, it would have been obvious to one of ordinary skill in the art to form the device of Zenke having the capacitor insulating film formed on the top surface of the capacitor lower electrode being thicker than that on the side of the lower electrode, such as taught by Kashihara et al. in order to increase the capacitance between the lower electrode and the upper electrode.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung K. Vu whose telephone number is (703) 308-4079. The examiner can normally be reached on Mon-Thurs 7:00-5:30, Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


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Vu

August 31, 2001

Steven Loke
Primary Examiner

A handwritten signature in cursive script that reads "Steven Loke". The signature is written in black ink and is positioned below the printed name and title.